American
GAS JOURNAL
Formerly American Gas Light Journal
EST. 1859
VOL. 121, No. 24
WHOLE NO. 3145
NEW YORK, SATURDAY, JUNE 14, 1924
Subscription $5 per year in Canada $6 per year

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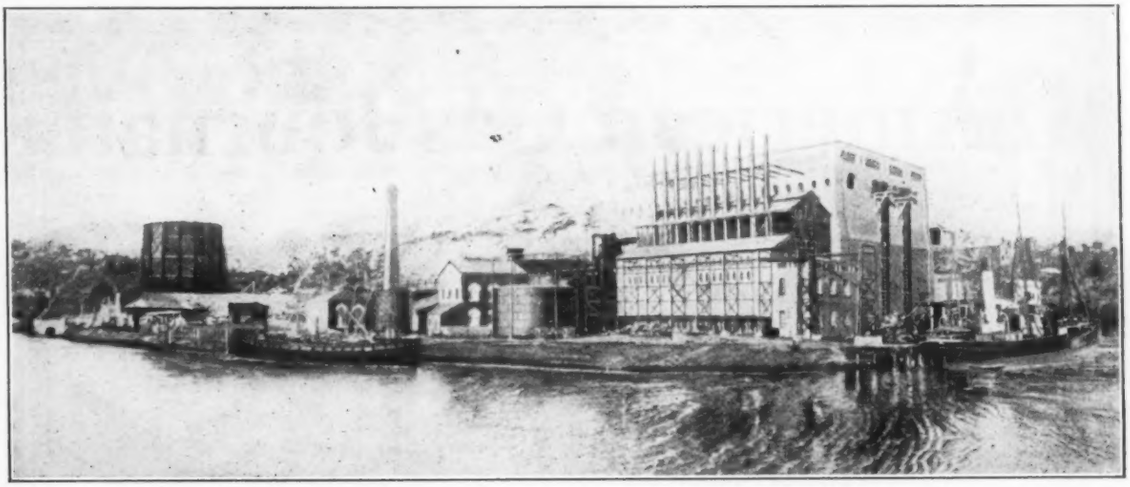

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American Gas Journal

SIXTY-FIFTH YEAR

Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. & Treas. C. S. MYERS, Vice-Pres. A. M. GLEASON, Sec'y.

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"APPLICANT FOR MEMBERSHIP IN THE AUDIT BUREAU OF CIRCULATIONS"

Contents of This Issue

Conditioning Textiles With Gas—By J. F. Springer **543**
Recovering Coke From Ashes—By Sterling H. Bunnell **545**
A Market of Changing Moods—By L. W. Alwyn-Schmidt **546**
Little Ideas That Have Made Good—By Harold F. Podhaski ... **547**
Part Payment Plan Produces Results **548**
What a Woman Told Us—By William H. Matlack **548**
Industrial Gas Lesson No. 24 ..... **549**
As the Journal Views It **551**
House Heating Business
Customer Ownership in the Gas Industry—By H. H. Hannah .. **552**
Catechism of Central Station Gas Engineering—24th Installment **553**
Electrolytic Corrosion in a Water Gas Holder **557**
By F. H. Rhodes and E. B. Johnson
The Indeterminate Permit for Public Utilities **558**
Current Market Prices **561**
News of the Gas Industry **562**

...scription $3.00 per year, including postage, in the United ...tates, Mexico, Cuba, Porto Rico, Hawaii or the Philip...pines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.

AMERICAN GAS JOURNAL, June 14, 1924. Vol. 120, No. 24. Published weekly by American Gas Light Journal, Inc., New York, N. Y. Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL

Vol. 120. No. 24 NEW YORK, JUNE 14, 1924 Whole No. 3466

Conditioning Textiles With Gas

Gas Heat Drying Apparatus Used in an Important Textile Operation

J. F. Springer

PROBABLY few people outside of textile circles realize that our clothing, whether undergarments or outside wear, contains a fairly considerable amount of water. It is, nevertheless, a fact, one which has a business bearing in the textile world. The presence of water in textiles is a matter for settlement between buyer and seller. This is due to the fact that the percentage of moisture varies with the humidity and temperature of the atmosphere. There would be no problem if the content of water were always the same for a given fibre. The buyer does not want to pay for water at the price of normal fibre. The seller does not want to dispose of fibre that is unusually dry on the same basis, as though it were in a more normal condition. There are concerns which make it their business to settle the matter in a way that is fair to both sides. Samples of the fibre are tested to ascertain precisely the right weight.

The Procedure Followed

For example, a large amount of silk fibre is purchased in Japan for shipment to New York. The season is exceedingly damp at the time of purchase and in consequence the fibre has absorbed a very considerable percentage of moisture. On the way over here the weather is warm and dry, so that by the time New York is reached the silk has become abnormally dry. It would be unjust to the purchaser to require payment at the price of normal silk for the weight of the shipment as disclosed in Japan. It would likewise be unjust to the seller to require payment upon the basis of the weight of the abnormally dry fibre as found by weighing in New York. It is pretty generally understood that silk is to be considered in a normal condition as to moisture when exactly 9.91 per cent of the total weight consists of water. The conditioning house—or, rather, the testing concern—steps in for the purpose of determining the condition of the silk when it is received in New York.

Where Gas Enters In

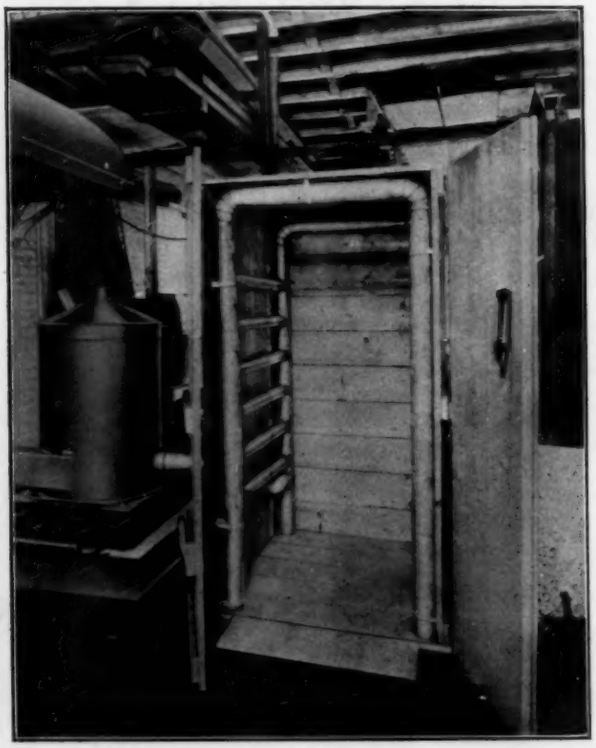
The interest of the gas salesman centers upon the fact that city gas may be, and is, used in driving out the moisture contained in the samples of silk. The moisture is driven out by the use of a conditioning oven heated to a point above the boiling point of water. The source of heat may be gas jets or electric current. The gas salesman should realize that he is in competition with electricity. He can claim economy of operation. And it does not appear that he need concede any substantial inferiority of operation. In short, whatever is saved in cost of operation is the true saving, all things being considered.

Moisture Content Varies in Other Fibres

The reader is not to get the idea that it is only silk fibre that contains a variable amount of moisture dependent on the weather. Cotton, worsted, wool, linen, and persumably all textiles of whatever kind or description, act in the same way. This moisture is not anything discernible to the touch. The fibre will look and feel perfectly dry. At the same time it will really contain a sensible amount of moisture. This is termed, technically, hygroscopic moisture. Fibres generally contain such moisture; but the amount varies according to the fibre, atmospheric conditions remaining the same. Thus, silk and wool under normal atmospheric conditions will contain about 10 or 11 per cent of hygroscopic moisture. Normal atmosphere here may be understood to be air at a temperature of 70 deg. F. and a relative humidity of 70 per cent. Cotton fibre that has been suitably exposed to such an atmosphere will contain 5¾ or 6 per cent of moisture. But, if the humidity changes, a change in the content of moisture for each and every fibre takes place, even though the temperature remains fixed. And if the relative humidity remains stationary, variations in the temperature cause variations in the moisture.

The State of Equilibrium Between Air and the Fibre

It is a notable scientific fact that a textile fibre and the surrounding atmosphere may be in equilibrium. The atmosphere generally contains more or less moisture. It can generally give up or absorb water vapor. The fibre which is at equilibrium with the air neither gains nor absorbs moisture from the air. Things are at a standstill. The percentage of moisture in the air and that in the fibre, at equilibrium, is not the same numerically. Generally, the percentage of moisture in the fibre is considerably less than that in the air at equilibrium. When atmosphere and fibre are not in equilibrium, moisture is being absorbed either by the fibre or the air.



Gas Operated Air Heater Supplying Heated, Clean Air for Drying Compartment

Commercial and domestic drying operations depend on this fact. Heat is unnecessary, if we have plenty of time. An absolutely dry atmosphere at the freezing point will probably sooner or later succeed in removing all the hygroscopic moisture from fibre, but it would consume a lot of time. Heat is of advantage because it quickens the operation. It is usual to use rather high temperatures in the testing ovens, 220 deg. F. for cotton and 250 deg. for animal fibres like wool and silk. Quick action is obtained at such temperatures.

Air Must Be Kept in Motion

However, it is necessary to circulate the air. If the air becomes stagnant, then that in direct contact with the fibre can no longer absorb moisture and the drying ceases or slows down very considerably. The compartment containing the samples of fibre from which the hygroscopic moisture is being driven must continually receive fresh air and the old air that has become more or less laden with moisture abstracted from the fibre, must be removed.

The Effect of Heat

The effect of heat upon air is its drying capacity. This is the basic reason for applying heat in drying operations. The air may be completely saturated, that is, it may contain all the moisture which it can absorb, and hence be entirely useless as a drying agent. But this air may be heated up 10 or 20 or 50 degrees and thereby converted into a successful drying agent. The higher the temperature the greater the maximum percentage of moisture that can be carried by the air. Its saturation point moves upward with the temperature.

Cooling the Air

An alternative procedure would be to cool the air and thus get rid of more or less moisture by precipitation. The same air, brought back to its original temperature, would then be a good drying agent. Another alternative is to remove the moisture from the air by some such agent as sulphuric acid. As a matter of fact, however, heating seems to be the best practice. Air, no matter what its degree of saturation, whether 100 per cent or less, can be made a drying agent of greater or less capacity by increasing its temperature.

At the same time, if the air contains any moisture, the fibre cannot be dried any further than to the point where air and fibre are in equilibrium. Circulation will not help. To remove all the hygroscopic moisture from fibre a drying agent containing practically no moisture at all must be available. When the fibre is in equilibrium with air containing zero moisture, then it is absolutely dry. Heat is used to effect this. Here is where city gas has its opportunity.

City gas is an inexpensive means of supplying the heat. The high temperature is easily obtained. And with gas the temperature is readily controlled against undesirable fluctuations.

The Regain

Among the technical terms useful to the gas salesman in this connection is the word "Regain." When the fibre has been deprived of all its hygroscopic moisture, its weight is determined. The dry weight of the entire lot can be calculated. But this is not the weight used in making payment. Payment is made on the basis of a standard condition of the

(Continued on page 560)

Recovering Coke From Ashes

A Machine That Obtains Values From Waste

Sterling H. Bunnell

IT IS common knowledge among engineers of gas works that a large percentage of carbon exists in the ash from both coal gas and water gas generating sets. Few engineers realize how large this percentage is; as it was hitherto irrecoverable, the exact proportion was of little interest. The world-wide increase in prices of fuel has in the last four or five years forced the giving of attention to such losses. This was particularly the case in Germany, where the comparatively small area trimmed off by the peace treaty carried most of the best German coal mines into other jurisdictions, and the occupation of the Ruhr took the rest. Among the resulting interesting developments is the ash separating and coke recovering machine, known in Germany as the "Kolumbus."

Operation of Machine

The machine consists in principle of a small tank of thin liquid mud—generally of common clay and water—with two screw conveyors working within it. Into this tank the ash is delivered through a rotating screen which rejects the fine dust. One of the screw conveyors continuously removes the silica or clinker, which sinks, and the other removes the carbon or coke, which floats. The power required is only about one horse-power per ton per hour.

More than 400 of these machines are used, not only in Germany, but also in England, Belgium, Switzerland and even Japan. Over forty in Germany and thirty in England have been purchased by city gas

works for use in their own plants. The writer on a recent journey to England took occasion to inspect some of these machines and obtain test records of their performance. In substance, the machine reclaims an average of 40 per cent of the total ash, as coke; this coke is being sold at the same price as

(Continued on page 552)

Results of "Kolumbus" Coke Separator in British Gas Works

	Coke	Ash	Clinker	From	Reported by
Croydon Gas Company	45.68*	32.24	21.87	Coal Gas	A. Caddick
	41.72*	33.87	24.45	Coal Gas	Engineer
Blackburn	44.	33.	23.		G. P. Mitchell, Eng. & Gen. Mgr.
Brighton & Hove	45.	20.	35.	Dump	Mgr. to Director
Hampton Court Gas Company	54.1	29.2	16.7	Coal Gas	W. E. Price, Manag. Director
Lea Bridge	41.6	36.9	21.5	Coal Gas	F. W. Cross
Nelson Corporation	42.15	31.41	26.44		J. Mitchell, Eng. & Gen. Mgr.
Oxford	43.1	31.9	25.		W. E. Caton
Richmond (Surrey)	40.3	27.1	32.6	Coal Gas	E. G. Hutchinson, A. M., I. M. E., Engineer & Mgr.
Ipswich	47.8				F. Prentice, Engineer & Mgr.
Southampton	53.12	24.47	22.39	Coal Gas	F. Durkin
Southampton	41.66	26.38	31.94	Water Gas	F. Durkin
North Middlesex	35.57	33.38	33.55	Coal Gas	L. Trewby, A. M., I. M. E., Eng. & Gen. Mgr.

*In this plant the weights of material in and out of the "Kolumbus" Separator were tested, and the increase due to water and clay carried out on the separated coke and clinker was 6.14 per cent and 4.87 per cent, respectively, in the two tests.

A Market of Changing Moods

Business Suffers from Attack of Nerves--No Cause For Alarm

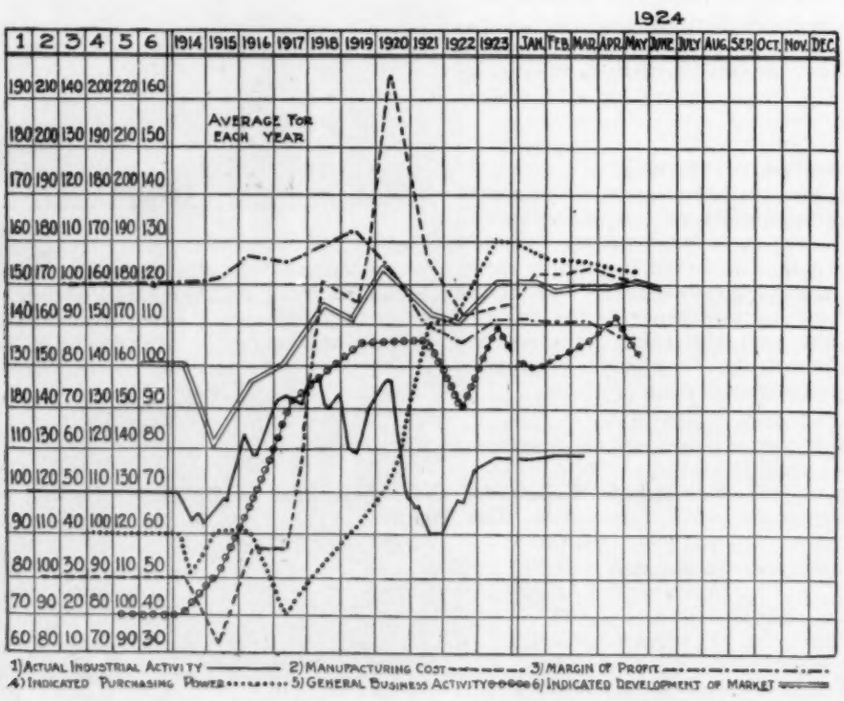
L. W. Alwyn-Schmidt

THE condition of the national markets, which had appeared healthy enough all through the spring, has suddenly taken a turn for the worse. We have cautioned against expansion early this year. This we now must do again, but we wish also to emphasize the need for an optimistic view of the situation. It is not at all so entirely hopeless as it is made to appear. There have all along been signs of weakness. But this weakness is not one of structure. It results principally from a combination of outward influences, such as the weather, economic conditions abroad and the national political situation. None is dependent upon the action of broad economic principles which finally will govern the course of our market.

There is in fact reason to assume that the present condition of the market is mostly one of personal attitude. Business suffers from a severe attack of nerves caused in part by the delayed recovery of the market predicted so definitely with the coming of the new year. Let us look into this more thoroughly.

An Analysis of the Situation

Is any inherent weakness apparent in the condition of national industry? Employment figures have declined during the last months against the comparatively high levels of last year. Employment, in fact, seems to have decreased at the rate of 5 per cent on the showing of still incomplete reports. The steel industry reports a slackening in orders. Glassware, the textile industry and the rug makers report reductions and the decline seems to run practically the whole gamut of industrial activity. But while a reduction in employment figures may mean a decline in industrial activity, it does not necessarily indicate fundamental weakening of the industrial structure. This is particularly the case if there has not been any preceding industrial expansion.


1924
1 2 3 4 5 6
1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC.
AVERAGE FOR EACH YEAR
1) Actual Industrial Activity
2) Manufacturing Cost
3) Margin of Profit
4) Indicated Purchasing Power
5) General Business Activity
6) Indicated Development of Market

We have had no over-production. The present limitation of production is furthermore accompanied almost everywhere by a corresponding reduction of production cost. Prices of industrial products are on a downward grade. But the downward movement proceeds sufficiently leisurely as not to disorganize the earning power of the industry. The profit margin has remained comparatively steady. It is somewhat less than last month, but higher, for instance, than during 1922. The industrial producer, therefore, is not in a rout. His action is rather one of watchful waiting for further

(Continued on page 559)

GAS MERCHANDISING

Domestic – Industrial

Little Ideas That Have Made Good

A few practical plans for building business

Harold F. Podhaski

THE Sterchi Company, Atlanta, Ga., recently arranged an especially attractive window display of stoves. People were invited to bring their kodaks to the store, take a picture of this display, and ten prizes were offered by the company for the ten best pictures taken. The first prize was $10. Several people took part in the contest and the store obtained a large number of good photos, which were advantageously used in newspaper advertising, and gave the firm considerable worth-while publicity.

——:o:——

The Southern Public Utilities Company, of Charlotte, N. C., increased the sale of gas stoves and equipment to a considerable degree as a result of a recent series of cooking and domestic science classes conducted by a well-known domestic science expert. Ladies of Charlotte were invited to enroll in the classes without cost or obligation, and a great many accepted the invitation. The result was that sales in the merchandising department were given a decided impetus.

——:o:——

A Northern merchant has been advertising for years that his store would give customers their purchase absolutely free if the clerks in the store failed to say "Thank you" when the purchase was made. The slogan has attracted considerable interest to the store on the part of the buying public, and has been largely responsible for building up a big business for this merchant.

——:o:——

A great many newspapers are now giving accident policies to their regular subscribers free as a premium for taking the paper. A Southern dealer worked the same plan as a premium with every purchase of $10 or more, giving a $500 accident policy. A policy like this with every sale of a new gas stove ought to stimulate sales considerably. Such insurance can be obtained at a very nominal figure from companies specializing in it.

——:o:——

A prize was offered by a Southern utility company for letters about gas stoves purchased from them that had given the longest service, during the progress of a special sale in which the firm agreed to take in the old gas stove at $10 in exchange for a new one. The result was that the company secured a great many valuable testimonials about stoves it had sold many years before. At the same time another way to use this idea would be to publish in advertising space the names of some fifteen or twenty people who had been using their gas stoves for, say, twelve or fifteen years. "Ask the party who owns one," would be an appropriate slogan with such an advertisement.

——:o:——

A furniture dealer in the South gave as a premium an order for half a dozen cabinet photographs at a local photographer's with every stove purchased during the progress of a recent sale. He himself was given a discount by the photographer, so that the cost was not prohibitive.

——:o:——

A Southern dealer put a large clock in the window wound up to its limit. Three prizes in merchandise worth $10 were offered to the three people guessing the nearest correct time when the clock would stop. The contest was unusual and attracted considerable attention, bringing the dealer considerable worth-while publicity. Dozens of people entered a guess as to when the clock would stop.

——:o:——

A year's subscription to your favorite magazine was a premium offered by one merchant with every $25 purchase at his store. It's an idea that ought to work well in the sale of gas stoves.

N. J. GAS ASSOCIATION ISSUES BULLETIN

What is believed to be the first regular paper issued by a state gas association has recently appeared under the title, "New Jersey Gas Association Bulletin." We take pleasure in welcoming this new paper to the field. We wish it the best of luck, and commend the enterprise which gave it birth.

The Bulletin is admirably arranged and is full of news and items of interest to members of the New Jersey Gas Association, as well as to other gas men. Th announcement is made that the Bulletin will appear in approximately quarterly numbers.

Part Payment Plan Produces Results

How a tank water heater campaign was conducted without price reductions

IN Portland, Oregon, they did not include tank heaters in National Gas Range Week, believing that it is better to concentrate on one thing at a time.

The Annual Tank Heater Sale this year followed immediately upon the heels of National Gas Range Week, which, on account of Easter, had been postponed a week or so.

"Twenty-five thousand broadsides," said John Hartog, sales manager, "were sent out to a select list of potential buyers, advertising the sale of tank heaters. The only inducement to buy was that the payment down would be only 75 cents and the remainder of the $28.75 could be paid at the rate of 50 cents a week, or, in other words, really $2 a month.

Advertising the Sales

"The sale was mentioned in a modest way in the Sunday papers and the first big ad. appeared the following day, Monday, at the beginning of the sale. Four columns by ten inches, or slightly less than a quarter page, was used in all the newspapers of that day, and the advertising was continued throughout the week, but was gradually decreased in size until the last day of the sale, when the final closing was announced.

"Last year the goal was set at 500, which was exceeded by about 20 per cent, a total of 602 tank heaters being sold. This year the goal was set at 600 and after a most strenuous week the total aggregated 775, which is far more than the total normal sale for the remaining 51 weeks of the year.

"In all the advertising the plumbers were referred to as being the ones that the customer could patronize, but in spite of that very few tank heaters were sold by them, although many of the plumbers were engaged by the gas company to help install them. It had been found in previous years that delaying the installation after the excitement of the sale was over often resulted in large cancellations from people who had changed their minds in the meanwhile."

Asked what price reduction was made to reach such a total, Mr. Hartog continued:

"There is something psychological in crowds and in hustle and bustle. Many of us have been influenced to buy something we did not want afterwards just because a crowd was clamoring for it, whether it was real estate or dry goods, or what not.

"It is a fact hard to explain why people should hold off buying and then flock in, to order a tank heater just to get the terms of 75 cents down and 50 cents a week, without any reduction in price whatsoever. Yes, in spite of the fact that some of the department stores, taking advantage of the gas company's efforts, advertised their tank heater at $18.50 installed on the stub! Ours was $28.75 installed. There are lots of things that cannot be explained by the human mind analyzing them, but the fact is that it is better to use any proposed cut in price for advertising and for a bonus to successful salesmen, rather than to give it to the customer, who generally doubts whether it is a real reduction or whether at other times he is being overcharged."

What a Woman Told Us

A word or two about canvassing

NOT long ago we talked to a dozen or so women to see what their attitude was towards the man who rings the door bell. Strange to say, their answers were almost identical and for that reason we are going to set them down here just as they were worked out from our notes.

When asked, "What sets your mind at ease when the salesman calls? Is it the manner of man you find at the door when you answer the ring of the bell or is it what the man says when you open the door?" To this one replied, "The man's appearance has a lot to do with whether or not I open the door. You see, I can usually size the man up from the inside before I open the door. If his appearance is neat, and if he is not working overtime on his spearmint or smoking a cigarette or cigar, I usually open the door. I do not like over-aggressiveness. When the man steps back as the door opens, takes off his hat and says, 'The gas company or Mr. Jones sent me up to see you, Mrs. Brown,' he gets my attention immediately, for, woman-like, I wonder what on earth the gas company or Mr. Jones wants."

The Interest and the Selling Punch in the Talk

Here we broke in: "This brings up a point. Once you have opened the door and the man has made his opening speech, what kind of a talk is it that arouses your interest to the point where you want to know more about the merchandise the salesman has been sent up to talk to you about? Also, what kind of selling talk in your opinion creates a desire and finally causes you to place an order?"

(Continued on page 559)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT YOU CAN DO IT BETTER WITH GAS

Lesson No. 24

The radiation of heat

Radiation at Higher Temperature Differentials

But when the temperature difference is high, this equation no longer holds good. Another more complicated equation must be used. The latter expresses the Stephan-Boltzman radiation law and states that the heat energy radiated by a black body is proportional to the difference of the fourth powers of the absolute temperatures of the radiating and receiving bodies. In mathematical form, it is as follows:

$$Q = D\ (T_2^4 - T_1^4).$$

Q is the B.t.u. of heat radiated per hour per square inch of surface; D is a constant; T_2 is the absolute temperature of the radiating body and T_1 is the absolute temperature of the receiving body, that is, the colder body.

It is evident that the substance that will radiate heat best will reflect heat worst. In other words, the absorbing power of a substance, such as lampblack, which is the ideal black body, and which hence possesses the radiating or absorbing power of unity, or 100, will be the inverse of the reflecting power, which in this case must be zero. A table showing the relation between the absorbing and reflecting powers of various substances is given in the following.

Relative Radiating and Reflecting Power of Different Subjects

(From Kent's Mechanical Engineers' Handbook)

Substance.	Radiating or absorbing power.	Reflecting power.
Lampblack	100	0
Water	100	0
Carbonate of lead	100	0
Writing paper	98	2
Ivory, jet, marble	93 to 98	7 to 2
Ordinary glass	90	10
Ice	85	15
Gum lac	72	28
Silver leaf on glass	27	73
Cast iron, brightly polished	25	75
Wrought iron, polished	23	77
Mercury, approximately	23	77
Zinc, polished	19	81
Steel, polished	17 to 19	83 to 81
Platinum, polished	24	76
Platinum, in sheet	17	83
Tin	15	85
Brass cast, brightly polished	7	93
Copper, varnished	14	86
Copper, hammered	7	93
Gold, plated	5	95
Gold on polished steel	3	97
Silver, polished bright	3	97

This table shows clearly that if a substance radiates a certain part of the heat it receives or contains, then it must reflect an amount of heat which is equal to 100 minus this percentage. However, it must be remembered that these figures are of relative value only. Various authorities differ on the values obtained for the radiating capacity of substances, and, moreover, there is some difference in the makeup of the equations which express the law of radiation of heat. The equation which has been given above, in which the quantity of heat radiated varies as the difference between the fourth powers of the absolute temperatures of the radiating and receiving bodies, is about as accurate an expression of the law as has been defined. Experiments have been made which confirm some of the results that are obtained by the application of this equation.

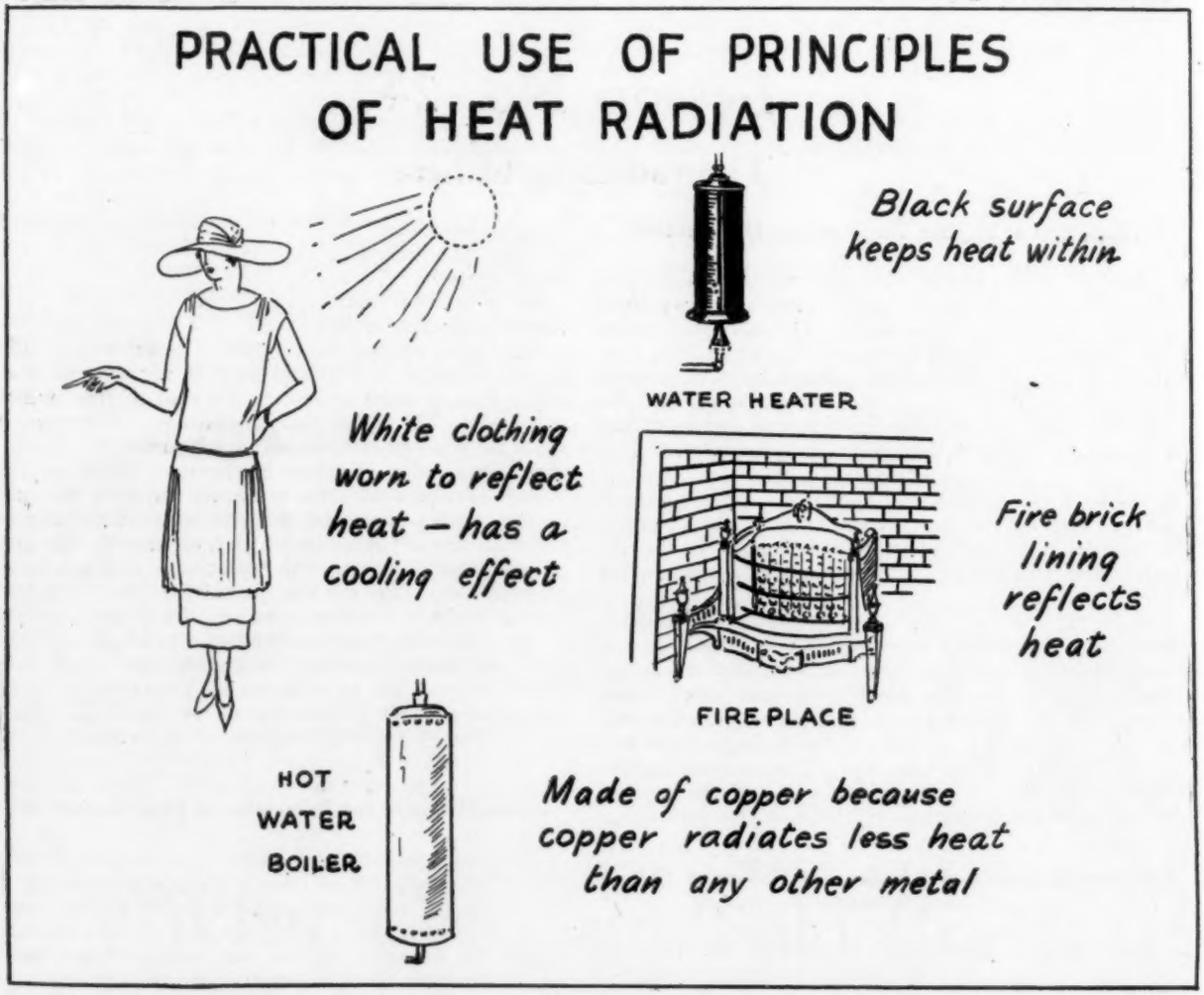
Applications of the Principles of Heat Radiation

The really important part of the laws and principles of the radiation of heat is their application in a practical way. The gas engineer should know something about this phase of the subject. He should recognize the reasons why certain materials are used in constructing heat generating or conducting machinery and equipment and why others are excluded. He will meet such practice in industrial work where it is desirous not only to produce high temperatures, but also to conserve as much heat as possible. In this connection he must remember that not only is it important to produce the high temperature in an industrial appliance by means of gas as a fuel, but it is also equally as important, if not more so, to produce this heat at the greatest economy, and in order to do so attention must be given to the heat reflecting and radiating characteristics of materials of construction.

Heat Radiating Characteristics of Some Substances

As a general rule, it may be said that white substances reflect heat, while black substances absorb or radiate it. This does not apply to every white sub-

stance, as, for example, white lead has as great radiating capacity for heat as lampblack, but it does apply to substances like cloth, cotton, wool and other organic materials, when exposed to luminous heat. in the fireplace. In order to stop the radiation of heat from steam pipes and other apparatus, in which it is desired to be conserved, it is common practice to coat them with heat insulating materials which


PRACTICAL USE OF PRINCIPLES OF HEAT RADIATION
Black surface keeps heat within
WATER HEATER
White clothing worn to reflect heat – has a cooling effect
Fire brick lining reflects heat
FIRE PLACE
HOT WATER BOILER
Made of copper because copper radiates less heat than any other metal

Thus, in the summer time, it is wise to wear white clothing, for white fabrics absorb less heat than black fabrics, and hence feel cooler.

The outsides of stoves and hot water apparatus should be black and the insides of fireplaces should be lined with firebrick. In the first instance the black surfaces of the heating apparatus enhance the radiation of heat, as does the inside lining of firebrick are white in color. Thus magnesia cement or asbestos coatings are employed. These have a two-fold effect. Not only do they radiate heat poorly, but they conduct it poorly as well, with the result that the heat in the pipes does not get to the outer surface of the same so readily and is not lost in so large amounts as it would be if the pipes were entirely exposed.

*RATE OF TRAVEL OF FUSION ZONE IN COKE OVEN

The rate of coking of coal has been studied by temperature and fusion zone pressures across a coke oven. Reliable temperature data at time of pushing have not been obtained, but the lower temperature range confirms date and statements found in the literature in respect to the mechanism of coking of coal. The study of the rate of travel of the fusion zone by means of pressures developed has been successful, and curves are included to show the variation in rate across the oven. The rate is high nearest the heating walls, decreases steadily to a minimum within a few inches of the center and then rises rapidly to a high maximum as the center is reached. The effect of oven width on the coking time is clearly indicated.

*Paper delivered before Gas and Fuel Section, spring meeting American Chemical Society.

As The Journal Views It

HOUSE HEATING BUSINESS

Perhaps one of the most interesting and important developments in the gas field of late years, and particularly during the past year, has been along house heating lines. Considerable attention has been paid to house heating during the past year or so, probably more in that short period than in all of the rest of the time that the gas industry has been serving the public. Many articles have been written and have appeared in the literature in connection with problems relating to house heating by gas, and there has scarcely been a convention or meeting of gas men that did not have the opportunity of listening to someone's experience in this newly developed field of the gas business. Many gas companies installed numerous installations during the past year and others have completed their experiments and are now ready to go after house heating business for the next season. It would seem that the practicability of gas house heating business has been established to the satisfaction of the great majority of gas men.

Of course, each individual gas company has its own conditions to meet, and it is not possible to develop a plan for obtaining house heating business which could successfully be applied by every gas company, irrespective of local conditions. This is not the way in which this type of business must be gone after. It is essential that a gas company study and understand thoroughly the conditions that exist in its community, and then take them into consideration in solving the problem. When this is done it is probable that the gas company will find the house heating load to its advantage, no matter what special circumstances affect the situation in the particular community it is serving.

It is a fact that certain gas companies have had considerable success with house heating business. It is understood that one very progressive but not particularly large gas company has had as many as 1,300 installations operating during the last winter. Some still smaller companies have developed house heating loads and have found them to be profitable, and larger companies as well have been giving special attention to this matter.

In one instance it has been pointed out that in order to balance the load which was caused by the installation of gas house heating systems, a special summer load was sought. This was obtained in the brick burning field. This use of gas is something of a novel proposition, as at a first glance it would hardly seem possible that gas could profitably be used for such an operation.

The moral of the matter is simply this: house heating business can be secured if a gas company wants it; furthermore, the load can be balanced by securing the proper kind of industrial business during the summer. There is more than one industry which runs full capacity during the summer and is entirely shut down, or almost so, during the winter time. House heating business is profitable under such conditions.

Then, again, it is rather easy to sell gas to the consumer for this purpose when the proper sales argument is used. It must be remembered, as has been pointed out, that in selling gas for house heating purposes, the gas must be sold, not on the cost basis, but as a more efficient and better fuel than any other that is, can, or may be used for housing heating Emphasis must be laid on the fact that the advantages which are to be gained from the use of gas as a fuel are attractive to the man who has the money to spend and who wants to spend a little more on his fuel bill and gain very definite and decided advantages thereby.

In other words, the same procedure in selling gas for house heating must be followed as in selling any other article of which there are different grades sold at different prices. The well-to-do man can afford to purchase gas as a fuel for house heating just as he can afford to purchase a better suit of clothes, and this applies as well to the average man in average circumstances who is desirous of having comfort and is willing to pay for it.

In conclusion, it may be said that up to the present time, in a certain sense, there has been satisfactory progress in the house heating field. Plans for the

next year's business are being laid now by progressive gas companies who are looking forward into the future and who see that it is possible to get this business if they go after it in the right manner.

There is no question but that people are gradually getting away from the use of coal and are turning to other fuels for house heating. In almost every large city there are numerous establishments which are marketing equipment for burning oil as a fuel. The gas man should have no hesitancy, nor any difficulty, in comparing his fuel with oil. It is only when he remains silent and does not do anything that oil gets the business.

There is no question but what the man who is willing to spend money for installing an oil burning plant in his home or establishment would be only too glad to use gas instead if he is brought to realize the disadvantages that oil possesses, and the advantages that he will obtain from the use of gas.

House heating business should form an important factor in the gas industry. It will form an important factor if the gas man makes the effort to secure it. The customer cannot help but realize that the ultimate fuel for house heating purposes is gas, and it is up to the gas companies to demonstrate this fact to him and to prove to him that in this case, as in every other—"If it is done with heat, it can be done better with gas."

RECOVERING COKE FROM ASHES

(Continued from page 545)

new coke, and is substantially equal to new coke in percentage of pure carbon; the separated clinker and the dust are salable at an average of 50 cents per load, where the ordinary unseparated ash could not even be given away.

Quality of Recovered Coke

The coke as delivered from the "Kolumbus" Separator carries very little water. Although coke is porous, the presence of air in the pores effectively keeps the separating fluid from penetrating; in fact, the coke is only in the tank a few seconds before being caught and removed by the screw. As the moisture dries off, a slight discoloration from clay or loam can be seen; and if the coke is to be sold it is therefore put through a simple drum washer, forming an attachment to the "Kolumbus" machine. For use within the gas works the presence of a trifling film of earth of course does no harm whatever.

Actual Results Obtained

The table of percentages is of interest to American gas engineers as giving a good idea of the amount of fuel lost in gas works ash, and now easily recoverable. The tests were made especially by the chief engineers or managers of the plants named, and each has been published with such authority in an English gas journal or a paper presented to some technical association, but they have not before been collected and presented in a group for easy comparison:

*CUSTOMER OWNERSHIP IN THE GAS INDUSTRY

Harvey H. Hannah

Customer ownership is developing rapidly in the gas industry and is another example of the fact that the people really own our public utilities through the ownership of their securities. During the first eight months of the year 1923, 187 gas companies, of which there is accurate record, sold 550,708 shares of stock to 107,094 purchasers. There were sold by the combination gas and electric companies in the same period 700,932 shares of stock to 120,076 purchasers, or a grand total of 1,251,640 shares of stock to 227,170 purchasers. The average number of shares of stock purchased by one person was 5.50 shares. The aggregate amount of money received from these sales was $106,836,000. This vast sum was obtained at a cost so low as to be heretofore unknown. The financial structure of the companies has been improved by strengthening the position of the senior securities, and in addition what it means to this industry, in the way of better public relations, to have upwards of 225,000 investors interested in the business cannot even be calculated.

Municipally Operated Plants Negligible

The number of gas plants operated by municipalities and the volume of output of such plants are both insignificant when compared to the number of gas plants and volume of output under private management. Your committee knows of no instance where there is the slightest reason to believe that any advantage whatsoever has accrued to the public in those few instances where gas plants are owned and operated by the municipality. It is the opinion of your committee that no gas plant operated by a municipality can or does give as good service in all respects as would be given by a privately operated plant.

Your committee deems it proper to remark that the operation and development of public utilities with private capital under private ownership, but subject to state and federal regulation and supervision as to adequacy of service at reasonable rates and other administrative regulations, are well-established principles in our social and industrial life.

Public regulation of private utilities partakes of practically all the advantages claimed for public ownership, without governmentally assuming their burdens, and, if public regulation fails, public ownership as an economic enterprise is bound to fail.

The activities of the public utilities during the wonderful development of this country have been almost entirely under private ownership, financed with private capital.

*Extracted from a report of the committee on public ownership and operation, read at the annual convention of the Chamber of Commerce of the U. S.

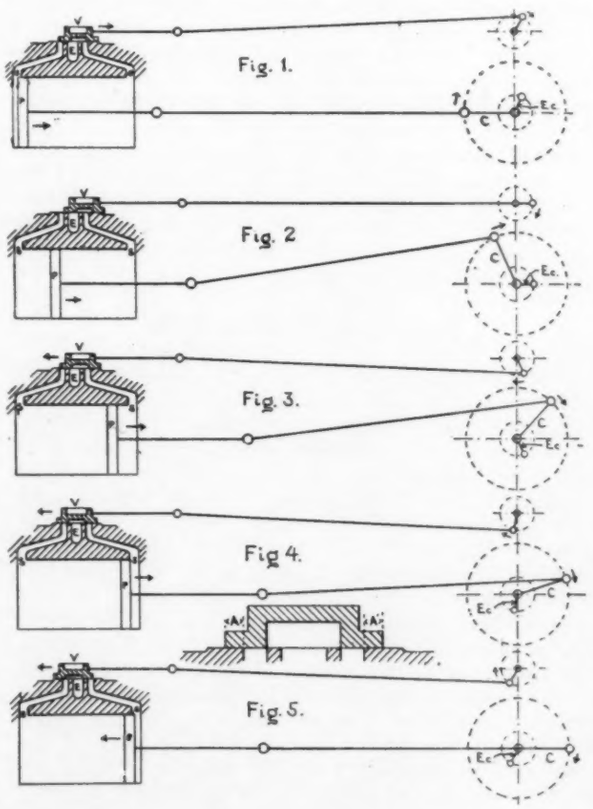
Catechism of Central Station Gas Engineering in the United States

Installment No. 24

(Continued from last week)

How the Valves Operate

The valve at first travels in the same direction as the piston, increasing the amount of opening for admission of steam, until, when the piston has traversed about one-quarter of its stroke, the full width of the port is opened, as shown in Fig. 2. The direction of the motion of the valve then changes, and it travels in the opposite direction to the piston, gradually decreasing the opening for steam, until, at the position shown in Fig. 3, the admission of steam is entirely cut off. The steam already in the left hand end of the cylinder continues to drive the piston forward, as its pressure



Steam Engine Diagram

is greater than the pressure in the right hand end, which is still open to the exhaust. From this point of the stroke the steam expands, still doing work, until the continued motion of the valve in a direction opposite to that of the piston again changes the conditions by closing the right hand steam port and putting the left hand one into communication with the exhaust port as shown in Fig. 4. As soon as this occurs, compression begins to take place on the right hand side of the piston, and the pressure on the left is lowered by the escape of the expanded steam to the air through the exhaust, the combined action gradually checking the motion of the piston now maintained solely by the inertia of the moving parts. Finally, just before the piston comes to a stop at the end of the stroke, the continued travel of the valve to the left begins to open the right hand steam port, and steam is admitted to the right of the cylinder in readiness for the return stroke from right to left. Fig. 5 shows the relative positions and direction of motion of valve and piston at the beginning of this stroke, during which the sequence of events is the same as that described above, the directions being reversed and left substituted for right, and vice versa.

Definition of Engine Parts Terms

Before considering the setting of eccentric and valve, we will define the terms used in connection with these parts of an engine. In the section of slide valve and valve face given in cut, the valve is shown in the position it occupies at half travel. The length A and A^1, by which it overlaps each steam port externally, is called the "outside lap" or simply the "lap." If the valve overlaps the port on the exhaust side, the length of such lap is called "inside lap." The valve shown has no inside lap. "Outside lead" is the width of the opening of the steam port for the admission of steam at the beginning of the stroke. "Inside lead" is the width of the opening of the steam port on the exhaust side at the beginning of the stroke. "Angular advance," or the advance of the eccentric, is the angle formed by the center line of the eccentric at half travel, and the position of the same line when the piston is at the commencement of its stroke. "Linear advance," or the advance of the valve, is the distance that the valve has travelled beyond the middle position when the piston is at the commencement of its stroke. The "travel" of the valve is the distance passed through in going from one extreme position to the other.

Distribution of Steam

The distribution of steam during the stroke of the piston, that is, the points at which admission begins and cut-off takes place, and at which compression

and exhaust commence, is regulated by varying the lap, lead and travel of the valve. For the class of engine we are considering, this distribution, once determined for any particular engine, cannot be varied. Having been so determined, the three elements named above are adjusted to give the required result, and the valve and eccentric designed accordingly.

Setting the Valve and Eccentric

To set valve and eccentric, the engine is set exactly on the center. To do this the brasses are set up until there is no looseness nor play in the bearings. A line is "scribed" on the guides and the cross head in such a manner as to permit of their being brought back at any time to precisely the same relative position, but with the crank the same distance above and below the center. Marks are also made on the crank disc, or the wheel, so that the arc traversed by a point on either, during the motion of the cross head from the marked position back to it again, can be exactly measured. This arc is then bisected, and the wheel or disc being moved back through the half-arc, the engine is on the center.

The eccentric is then set in position at the determined angle with the crank, and the valve secured on the stem with the determined "lead." Turning the wheel a half revolution to bring the engine on the opposite center, the "lead" is again measured, and if not exactly the same as at the other end, the valve is readjusted on its stem until the "lead" is equal at both ends. This done, the eccentric is moved until the amount of the "lead" is right as determined, and the setting is complete.

Running Exhaust Pipe for Non-Condensing Steam Engine

131. What is the principal point to be borne in mind in running the exhaust pipe for a non-condensing steam engine?

Ans. The principal point to be borne in mind in running the exhaust pipe of a non-condensing steam engine, or, for that matter, any other type of engine, is that the steam should be allowed to escape from the cylinder of the engine with as little resistance as possible to its flow, since whatever resistance is encountered throws just so much back pressure upon the piston of the engine and reduces the effective work done by increasing the amount of useless work. To avoid resistance the exhaust pipe should be made ample in size, and no sharp bends should be allowed —long turn elbows, or, better yet, pieces of pipe bent to long curves, being used for all turns which it is necessary to have. While these are very simple precautions, they are very often overlooked, although the cost of the amount of steam saved by reducing the back pressure to a minimum will soon pay for all the extra expense incurred in running the exhaust pipe properly.

Determining Efficiency of a Steam Engine

132. How would you proceed to determine the efficiency of the steam engine as a machine, and what is an average for this efficiency in small engines such as are commonly used in gas works?

Ans. To determine the efficiency of the steam engine as a machine, it is necessary to ascertain the amount of power exerted on the piston of the engine by the steam used in the cylinder, and the amount of power available at the engine shaft. The latter amount divided by the former gives the efficiency of the engine as a machine, which efficiency is always less than 1, and in the case of small engines is usually between 0.75 and 0.85.

The Mean Effective Pressure

To obtain the power exerted on the piston by the steam used, the mean effective pressure of the steam in pounds is calculated from a series of Indicator diagrams taken at equal, short intervals during the test, which should be of sufficient duration to insure the securing of average results. The quotient obtained by dividing the sum of the mean effective pressures shown on all the diagrams by the number of diagrams is the pressure to be used in the calculation. There is also required for computing the power exerted in the cylinder, the net area of the piston in square inches and the mean piston speed in feet; the latter being obtained by multiplying the length of the stroke in feet by 2 (since there are two strokes to each revolution) and the product so given by the mean number of revolutions per minute determined by frequent countings during the test. The final product resulting from the continued multiplication of the mean effective pressure, the net area of the piston and the piston speed is the work done per minute in foot pounds, which, divided by 33,000, gives the horse-power obtained in the cylinder, that is, the indicated horse-power.

The Use of a Friction Brake

The available power at the engine shaft is usually obtained by the use of some sort of friction brake. A simple form is made of two blocks of wood hollowed out to fit a portion of the circumference of the pulley on opposite sides of which they are to be clamped. Two bolts passing through both blocks, one on each side of the pulley, complete the brake proper. The pressure, and therefore the amount of friction, is adjusted by drawing up or loosening the nuts on these bolts. To measure the power one end of a wooden beam is fastened to one of the blocks by the same bolts that clamp the blocks. The downward pull due to the weight of the overhanging end of the beam should be exactly counterbalanced by weights suspended from the short end on the opposite side of the shaft. At the extreme point of the long arm is attached a spring balance. Stops are provided above and below the beam to limit its possible motion.

Actual Process of Determining Power

The engine, being started, is slowly brought to full speed, the bolts on the brake being drawn up

gradually, until the joint effect of the friction when the engine is at the desired speed and the pull of the balance in the opposite direction is such as to keep the beam arm in equilibrium free of the stops and in the space between them. The amount of the pull of the balance, as obtained by averaging a number of readings made at equal intervals during the test, is the force in pounds which is exerted, during each revolution, through a distance equal to the circumference of a circle with a radius equal to the effective length of the brake arm. The distance through which the force will be exerted in a minute will be equal to this circumference multiplied by the mean number of revolutions per minute. If, therefore, we represent the effective length of the brake arm in feet by L, the pull in pounds on the end of the arm by W, and the mean number of revolutions per minute by N, the circumference of the circle will be $2 \times 3.1416 \times L$ and the power available per minute will be $2 \times 3.146 \times L \times N \times W$, and the horse-power at the engine shaft, that is, the effective or brake horse-power will be $\frac{2 \times 3.1416 \times LNW}{33{,}000}$

As previously stated, the quotient obtained by dividing this effective horse-power by the indicated horse-power is the efficiency of the engine as a machine.

The Indicator and Its Use on the Steam Engine

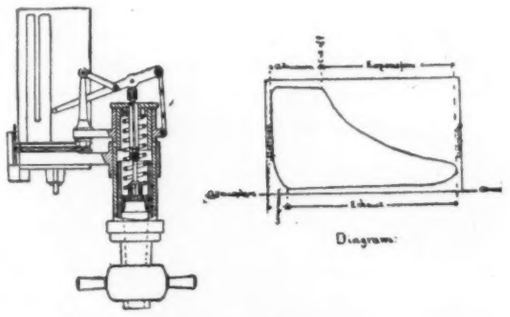
133. Describe an Indicator and its use in connection with a steam engine.

Ans. An Indicator is an instrument used to measure and register continuously and simultaneously the conditions of pressure and volume of the working fluid existing in the cylinder of a heat engine at work.

As now made, the indicator consists of a cylinder containing a piston working against a spring. Attached to the piston is a rod with its head so connected to a lever that the motion of the piston is multiplied and transferred to a pencil holder, the path of which is kept parallel to that of the piston by means of some form of parallel motion. A pencil placed in this holder can be brought into contact with a sheet of paper wrapped around a drum made to turn about its axis with a reciprocating motion by a cord wound around its base and connected to the proper point on a "pantagraph," or other form of "reducing motion," attached to and moving with the cross-head of the engine; which cord works in opposition to a spring fastened to the drum.

The Fittings

Suitable fittings, including a steam cock, are provided for making a connection between the indicator cylinder and the engine cylinder. When this connection has been made and the cock opened the pressure of the working fluid in the engine cylinder is communicated to the bottom of the indicator piston, causing both it and the pencil to rise and fall with the rise and fall of pressure in the engine cylinder. At the same time the cord on the drum being connected to the reducing motion, the drum and paper rotate back and forth as the engine piston moves. Then by pressing the pencil lightly against ditions of pressure and volume of the working fluid in the cylinder as they exist throughout the period of contact, which is usually limited, as nearly as possible, to one revolution of the engine. Each diagram



The Indicator

or "Indicator-card" gives a record of the conditions, on one side of the piston only, during one revolution of the shaft, so a pair of cards taken at the same time and one from each side of the piston are necessary to furnish a complete record for one revolution of the engine. In these diagrams, vertical distances above or below a horizontal line traced on the paper when the piston is at its normal position and free from pressure represent pressures in pounds per square inch above or below atmospheric pressure on a scale varying with the strength of the spring employed; and horizontal distances represent the travel of the engine piston on a scale determined by the proportions of the reducing motion employed.

To insure the accuracy of the diagrams it is necessary that any given indicator should be tested and standardized before being used. The principal sources of error, apart from inaccurate springs, are the inertia and friction of the moving parts, the friction of the pencil on the paper, and the elasticity of the cord used to impart motion to the drum. To overcome inertia the moving parts are made as light as possible. The friction of the piston is reduced to a minimum by making it fit loosely in the cylinder, the best makes showing an observable leak between piston and cylinder under high pressure; openings being left in the upper part of the cylinder sufficiently large to prevent this leak from giving rise to any excess of pressure above the piston. The friction of pencil on paper is reduced to a minimum by the use of a very hard lead pencil, or one of soft metal brought to a sharp point, and a highly glazed paper so that a light, steady pressure will produce a very fine but entirely distinct line. The cord should always be stretched by a heavy weight before being used, but even when this is done will retain some elasticity, and a fine steel wire is to be preferred. The effect of this elasticity can be reduced by proportioning the strength of the spring in the base of the drum to the inertia of the drum so as to make the pull on the cord practically constant.

The spring against which the piston works should be tested by connecting the indicator with the spring in place, to a steam reservoir, in such a manner that the pressure can be held at any desired point on both the indicator and a correct gauge long enough to enable readings of each to be taken deliberately and accurately. These readings should agree when the spring is hot, since in practice the spring will be hot when used. The springs should be so made and attached that they will not, when under pressure, throw the piston out of line and cramp it in the cylinder.

Properties of a Good Indicator

According to Dr. R. H. Thurston the best indicator is that "which has proportionally the largest and lightest piston, the stiffest and lightest springs, the least friction of moving parts, the most perfect pencil mechanism, the most accurate and constant scale of pressures, the most perfect adjustment of drum-spring, and the lightest moving parts generally," but in no instrument, however well made, is it found possible to "wholly eliminate the influences of inertia of moving parts, friction of joints and guides, if the latter be used, and of piston or pencil, or the effects of variation of spring tension on the motion of paper cylinder and card. Standardization is the process of detecting and measuring such errors as are observable in the action of the apparatus, and the determination of their influence on the indications obtained by its use."

The connection between indicator and engine cylinder should be sufficiently large and free from bends and angles to insure the transfer of the pressure in the cylinder to the indicator without loss. The hole in the cylinder should be so located that it will not be covered by the piston at the end of the stroke, and that the steam entering the cylinder by the steam port does not blow across it and thus affect the pressure in the pipe leading from it.

The Indicator Diagram

Again quoting Dr. R. H. Thurston, "Manual of the Steam Engine," "Indicator-diagrams taken under proper conditions and with good instruments, are diagrams of energy on which the ordinates measure the varying pressures in the cylinder, corresponding to the positions of the piston as measured off by the simultaneous abscissas of the diagram; while the area represents the work done by the steam on the piston of the engine" and by their means "it becomes possible to ascertain the nature and cause of almost every defect in the distribution of pressures and volumes of the working fluid, as in the adjustment of the valve-motion, and the size or proportions of steam passages or of the connecting pipes. The power exerted by the steam is easily measurable. These several points may be summarized thus:

(1) Gross power exerted by the steam.
(2) Net power of the steam, and equivalent net power of the engine.
(3) Resistance of unloaded engine.
(4) Net power of the engine.
(5) Details of various wastes of power, as by wire-drawing, back-pressure, etc.
(6) Valve-adjustments.
(7) Effectiveness of valve-gearing.
(8) Adequacy of sizes of port.
(9) Quantity of steam present at any point in the stroke.
(10) Feed-water demanded, exclusive of that wasted by cylinder condensation.
(11) With a boiler-trial, the actual expenditure of steam, fuel and money, for a given amount of power; and wastes by leakage and condensation.

The Calculations

"Of these, the principal are only determined by careful computation, employing as data the quantities graphically measured on the indicator-diagram; others are at once seen by the practised eye, demanding only an inspection of the figures shown on the card. An engine well adapted to this purpose, a perfect engine in the engineer's sense, will usually exhibit an early induction; wide port-opening; an admission-line closely approaching boiler-pressure, and nearly or quite horizontal; a sharp cut-off; an expansion-line closely approaching the common, or equilateral, hyperbola in form; a somewhat early and a prompt release or exhaust; a low and uniform back-pressure, and a compression carried up well toward initial pressure. These effects are obtained by giving some steam and exhaust lead—greater as speeds and pressures are higher, having good area of ports, securing quick action of the expansion-valve, and a well-adjusted closure of the exhaust-valve. Any departure from these conditions is ordinarily to be taken as evidence of defective construction or adjustment."

The cut shows an indicator partly in section and also an imaginary diagram. The student, of course, should study up the subject more fully before relying upon his ability to use an indicator. Good books for this purpose are "A Hand Book of Engine and Boiler Trials, and the Use of the Indicator and the Prony Brake," by Dr. R. H. Thurston, and "Practical Instructions for Using the Steam Engine Indicator," published by the Crosby Steam Gauge and Valve Co., Boston, Mass.

The Mackenzie, Root and Fan Exhausters

134. Give a description, illustrated with sketches, of the construction and action of a Mackenzie exhauster. Of a Root exhauster. Of a Fan exhauster.

Ans. The Mackenzie exhauster belongs to the class of so-called rotary positive exhausters. An elevation and vertical cross section are shown on the cut. A is a cast-iron case, the general shape of which is cylindrical, with inlet and outlet openings as shown. The moving parts consist of the hollow drum D, open at both ends, the blades B, B, B, and the rolls R, R, R.

(Twenty-fifth Installment Next Week)

Electrolytic Corrosion in a Water-Gas Holder*

Corrosion is shown to be more simple than rusting

F. H. Rhodes and E. B. Johnson

THE attention of the authors was called recently to an instance of electrolytic corrosion, some features of which were sufficiently interesting and unusual to justify the publication of a description of the case.

In the outer tank of a gas holder severe corrosion developed throughout a horizontal zone extending from about four inches to about three feet below the level of the sealing water. Throughout this entire zone the steel was badly attacked and many holes—some of them as large as 0.25 inch in diameter—had been eaten through the plates. There was no evidence of attack at or just below the level of the sealing water nor in the lower part of the tank.

The particular holder in which this corrosion occurred was a relief gas holder which received raw gas directly from the water-gas machines. At the same plant another holder, wihch was used for storing a mixture of purified water gas and purified coal gas, showed no evidence of localized attack. It appeared very probable, therefore, that the corrosion was due either directly or indirectly to the presence of some impurity (possibly hydrogen sulfide) in the raw gas.

Analysis of Sealing Water

Samples of the sealing water from near the surface and from about 20 feet below the surface were analyzed for total sulfur. The results were as follows:

	Grams per Liter
Sulfur in water from top.....	0.0055
Sulfur in water from 20 ft. below surface	0.0109

A sample of the scale formed on the plates at the corrosion zone was dried by washing with alcohol, freed from tarry matter by extraction with benzene, dried, and analyzed. The results of the analysfs were as follows:

	Per cent	
FeS	0.7	
Fe_3O_4	89.4	
Free carbon	8.9	(by difference)

Corrosion Not Due to Simple Rusting

That the corrosion was not due to the simple rusting of the iron by oxygen dissolved in the water is indicated by the fact that the attack was more severe below the water level than at the surface of the water where the concentration of dissolved oxygen was greatest. That the corrosion was not due to the simple chemical action of the dissolved hydrogen sulfide on the iron is shown by the fact that the attack was confined to a narrow zone near the top of the holder, although the water near the bottom of the holder was in more direct contact with the gas and should contain a higher concentration of dissolved hydrogen sulfide. Furthermore, the large amount of iron oxide in the scale indicates that the pitting was not caused by the simple chemical action of the dissolved hydrogen sulfide.

Corrosion Electrolytic in Nature

The observed facts may be explained by the assumption that the corrosion was electrolytic in character, the required difference of potential for the electrolysis being produced by an oxidation-reduction cell. The water at the top of the holder contained some dissolved oxygen, and the iron shell in contact with this oxidizing solution formed the cathode; the water at some distance below the surface contained dissolved hydrogen sulfide and possibly other active reducing substances, so that the iron shell in contact with this reducing solution formed the anode. Naturally, the electrolysis would be confined to the region near the zone in which the transition from the oxidizing solution to the reducing solution took place; and most of the corrosion would occur immediately below this transition zone. This electrolytic theory, therefore, explains the fact that the corrosion is confined to a narrow band somewhat below the water level. The theory also accounts for the large amount of iron oxide in the scale.

Analysis of Scale

The scale contained almost 9 per cent of free carbon. This free carbon can hardly be accounted for by assuming it was the normal residue left after removal of the adhering tar by extracting the scale with benzene, for the amount of tar adhering to the scale was small and the free carbon content of normal water-gas tar is low. The large amount of free carbon may be accounted for by the assumption that the electrolytic oxidation resulted not only in the corrosion of the iron, but also in the oxidation of some of the adhering tar, with the formation of a residue which was insoluble in benzene.

Substantiation of Electrolysis Theory

In order to confirm the theory that an oxidation-reduction cell was established by the metal in contact with the upper and lower layers of the water in the holder, a cell was constructed in which one element was an iron wire in contact with a portion of

*From Industrial and Engineering Chemistry.

the sealing water taken from the lower part of the holder, while the other element was a similar wire in contact with some of the water from the surface. The electromotive force of this cell, as measured by a potentiometer, was 0.02 volt—the wire in the water from the top of the holder being the cathode. The wire in the reducing solution was very appreciably corroded, while the wire in the surface water remained bright.

A clean iron wire was placed in a tube of gelatin jelly, the upper and lower parts of which were made up with water from the upper and lower parts of the holder, respectively. On standing for a short time, the iron was markedly corroded below the point of contact of the two layers. A clean iron wire immersed in the oxidizing solution alone remained clean and bright; while an iron wire immersed in the reducing solution alone became at once coated with a thin, dark film and then remained unchanged and did not further corrode.

Conclusion

These experiments show that the corrosion was essentially electrochemical in character and that it was not due to the simple chemical action of either of the solutions on the iron. This particular case of electrolytic corrosion is, however, a very interesting and rather unusual one, for the electrolysis is brought about by having a single piece of metal in contact with two solutions of different oxidizing power rather than by having two different metals in contact with each other and with a single solution.

The Indeterminate Permit for Public Utilities

General Definition

The indeterminate permit or franchise is the right indefinitely to occupy the streets and highways for the purpose of furnishing the public with utility service for just compensation, subject to the public utility law of the state.

States Which Have Adopted the Indeterminate Permit

The so-called indeterminate permit in respect to one or more utilities has been adopted by law in Wisconsin, Arkansas, California, Indiana, Louisiana, Minnesota and Ohio. A bill providing for the indeterminate permit was introduced in the Oklahoma Legislature this year, but failed of passage.

How the Law Works

Generally, the law relating to indeterminate permits leaves it optional with the utility to surrender its existing franchise and receive in lieu thereof as a matter of law an indeterminate permit. In both Wisconsin and Indiana the time within which the voluntary surrender can be made has expired. It is generally provided that new franchises granted by a municipality shall ipso facto be indeterminate permits. In Wisconsin the optional feature was repealed when the Legislature in 1911 declared all existing franchises to be indeterminate permits (a law hereinafter referred to and held at least in part to be unconstitutional by the Supreme Court of the United States).

The laws generally include provisions that the municipality may purchase the utility property within the municipality for a fair compensation, and that the utility shall not be subjected to competing utility service in its field except upon the finding and issuance of a certificate by the regulatory commission that public convenience and necessity require such competing utility. In Indiana the protection against competition by a municipally owned plant, except upon the issuance of a certificate of convenience and necessity, applies only to utilities that have taken out indeterminate permits.

Advantages of the Indeterminate Permit

It takes the place of the local franchise and is the right granted directly by the state indefinitely to occupy streets and highways during good behavior, subject to state regulation as to rates and servicce.

It protects the utility against competition without a certificate of convenience and necessity issued by a state body acting judicially.

It protects investment against any unreasonable risks of loss existing in the case of ordinary franchises at the expiration of the grant.

It affords just compensation in case of municipal purchase and prevents the practical confiscation of property by forced purchase at the time of the expiration of the franchise.

It improves the financial status of the utility by doing away with amortization charges against consumers, necessary under a limited term franchise to amortize investment within the life of the grant. This assures the possibility of more reasonable rates to consumers.

It substitutes the impartial and independent supervision of state commission for the generally restrictive provisions of the limited franchises.

It abolishes the free or special rate services to municipalities and provides that the rates and service fixed in limited term franchises shall be subject to revision by the state commission.

It eliminates the frequent bartering for franchises with the municipal authorities which is often detrimental to public interest, and thus improves the relations between the public and utility.

It insures uniform and harmonious treatment of all utilities in the state and also the best practicable service at the lowest practicable cost.

It is in force in seven states and has been recommended for adoption by the American Electric Railway Association, Investment Bankers Association of America, and the National Association of Railroad and Utilities Commissioners.

A MARKET OF CHANGING MOODS

(Continued from page 546)

developments. These developments will be governed principally by the future movement of the national purchasing power.

Decline in Purchasing Power

National purchasing power has been high during the last half year of 1923. It is now declining. The decline is caused by the slow depletion of the purchasing reserve, by the reduction in the number of employed wage earners, by the reduction of individual earnings. It is counteracted by the ability of the producing industry to take smaller profits and by the resulting decline in prices. Following the action of these co-operating factors, there has existed all along a peculiar but satisfying balance of forces, leaving the purchasing power of the nation approximately the same since February. It stands, however, below the scale of the second half of last year. The question now is: Is the present scale low or was that of last year exceptionally high? Comparison with the figures of former years emphatically points to the second condition. The present level must be regarded as normal. That of last year was abnormal.

The Effect of the Weather

It stands to reason that if industry is not losing money, but operates with reasonable profits, and if at the same time the national purchasing power continues to move upon a normal level, as the result of both, business cannot be so bad as it is painted. The fact is that matters would be comparatively good in all retail markets if only the weather would be more favorable. As it is, the weather has played havoc with the retail business. It has done more to upset calculations than any other factor involved in producing the present situation.

But even the weather cannot continue unfavorable all the time. The turn must come and with it will come a renewed confidence in the carrying ability of the market.

A Market of Changing Moods

Ours is at the best a market of changing moods, and the fact that we are in a Presidential year with all its uncertainties by no means improves matters. So business men prefer to move cautiously. They are well advised to do so because their caution will assist the recovery of the market at the proper time.

In the meantime it behooves everybody to keep cool. Those who have acted conservatively during January and February have no cause for worry. Nothing has happened to change their opinion of the stability and general healthy aspect of the market. As pointed out, the conditions depressing the market are largely artificial. They will change in a very short time. We cannot always have prosperity, but even the present lower levels of market activity are far in excess of such normalcy as we were accustomed to before the war.

There is no cause for a panic. All that is required is a sane attitude and a level mind in dealing with all and every aspect of the situation. Especially let us not forget that this time of the year is invariably accompanied by temporary slackening of all industrial activity.

WHAT A WOMAN TOLD US

(Continued from page 548)

"As for that," replied Mrs. Brown, "I do not know that I have thought very much about those things, yet I am quite sure I can immediately detect a memorized talk, and when a man comes to my door to say his talk I do not know why, but I rather doubt his sincerity. On the other hand, I do believe, when a man comes to my home with an intelligent knowledge of his merchandise and the merchandise of a kindred nature on the market, and is neat in appearance and sincere in his talk, that I do listen to him, and, all said and done, I presume it is the salesman of this type that sells me the most merchandise, in and out of my home."

We are of the same opinion. Everyone looks with suspicion on the salesman who says: "Why, it's the finest thing you ever saw," and "blaw-blow and this, that and the other thing, etc., etc., blaw, blooy, blow." Talk of that kind, bathing water and a foot-in-the-door undoubtedly have lost many sales, equally as many as the fact that the salesman does not know his line, from soup to nuts, or that he knows so much about it that he does not believe in it, with the result that he cannot make other folks do so.

FUEL GAS FROM LOW GRADE MATERIALS

Fuel gas, e. g., blue water gas or mixed gas, is usually made from coke in coarse lumps which are subjected to the action of air and steam alternately. The present invention makes use of small sized coal, refuse coke, coke dust, lignite coke, etc., in the form of powder or small granules. The carbonaceous material is placed on a plate of perforated pipeclay at the bottom of a cylindrical shaft furnace or producer. Air is blown in from below at a gradually increasing pressure, until the particles of coke are given a movement having the appearance of boiling. By this means a free passage of gas is secured, and the combustion is rendered uniform through the whole mass while the ash is carried out of the furnace with the gases. The air is cut off when the temperature reaches about 1100 deg. C., and steam is supplied at a similar pressure. The resulting blue water gas is composed approximately of carbon monoxide, 43 per cent; hydrogen, 45 per cent; carbon dioxide, 2.5 per cent, and no methane.—Patented in British Patent No. 214,544 by the Badische Anilin und Soda Fabrik.

CONDITIONING TEXTILES WITH GAS

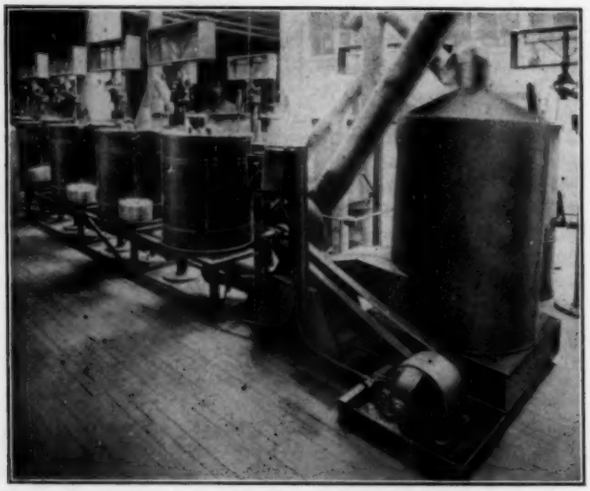
(Continued from page 544)

fibre. Instead of stating this condition as one characterized by a certain content of moisture expressed as a percentage of the whole weight, moisture and all, it is quite usual to define the normal condition by the moisture content as a percentage of the absolutely dry weight. This percentage is the regain.

Thus, instead of saying that silk should be in such condition that 9.91 per cent of the weight is moisture, it is very usual to say that there should be a regain of 11 per cent on the dry weight.

The Use of the Gas-Operated Oven

The gas-operated testing oven can be used, not only for the purpose of driving off all moisture and thus ascertaining the dry weight, but the same oven, or one suitably modified, can also be employed to maintain a definite atmosphere, in which fibres may be brought to equilibrium. As various fibres will regain different percentages, the results were employed to determine the character of the fibre. The whole procedure of driving out all moisture, weighing, obtaining equilibrium in a known and definite atmosphere, and weighing again, may be used as a means of discriminating between pure wool and a mixture of wool and cotton, between pure silk and a mixture of silk and some other fibre, and so on.



A Battery of Gas Operated Air Heaters Supplying Air for Drying Silk

Conditioning Textiles a New Field for Gas

There is a new field in prospect for the gas-operated conditioning oven. The gas-operated conditioning process can be used for two distinct purposes: (1) for discriminating qualitatively between the textile fibres; and (2) for determining quantitatively the proportions of fibres in a mixture. There are objections to the chemical methods. First, they are messy. Second, they appear to be subject to more or less uncertainty, because in destroying one fibre in a mixture by means of chemical action an unknown amount of other fibres is also destroyed.

Special Type of Air Heater

Whether the air conditioning apparatus, operated by city gas, is used to test fibres as a means of detecting fibres and of determining their respective weights in mixtures, it is important to have in mind that the air heater must be of a type in which neither the gas flame nor the products of combustion are permitted to come in contact with the hot air current supplying the oven. The air heater, if separated from the oven, must accordingly be so designed that two separate and distinct air currents pass through it. First, there is the air current which supplies the gas burners with oxygen. Second, there is the air current which passes through the heater for the sole purpose of absorbing heat. No contact between the two streams is permissible under any circumstances. Otherwise, the air passing through the conditioning oven may affect the weight of the fibre by contamination with the products of combustion, viz., carbon, carbon monoxide, carbon dioxide, sulphur dioxide, etc.

Conditioning Commercial Lots

Air heaters operated by gas are also useful as a means of conditioning commercial lots as well. The term conditioning, perhaps, is more suitably applied thereto. What is wanted is not an absolutely bone dry fabric but a condition where there is no superficial moisture and where the hygroscopic moisture is a certain definite amount. For example, when animal fibres, like silk and wool, are carbonized, which has for its purpose the charring and ultimate removal of vegetable matter entangled in the animal fibre, the fibre becomes excessively dry. This dry condition may be objectionable when the fabric is to be worked up at once. It is desirable, not to say necessary, that the fibre be put into the proper condition.

A HOUSE IN ORDER

The third edition of "A House in Order," the year book of the Consolidated Gas, Electric Light & Power Company of Baltimore, covering its operations for 1923, has been printed. This last edition, which is in miniature form, is being sent to every customer of the company. As stated in the preface of the book by the editor, Arthur W. Hawks, Jr., "The issuance of a year book setting forth the affairs of the company during 1922 marked a broadening of the policy of the management and is giving the operations of the company still wider publicity. The company desired that its stockholders and customers know as much as possible about its properties, its growth, its policies and its achievements. The gratifying interest displayed in its year book for 1922 led to the preparation of a second publication of this nature."

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.40 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	(*)
Kanawha mine run	Columbus	(*)
West Virginia lump	Cincinnati	2.00 to 2.25
W. Virginia gas mine run	Cincinnati	1.25 to 1.50
Midwest		
Indiana 4th vein lump	Chicago	2.75 to 3.00
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.90 to 3.10
Big Seam mine run	Birmingham	1.75 to 2.00
Southeast Kentucky lump	Louisville	2.00 to 2.35
Southeast Kentucky mine run	Louisville	1.25 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

Market	Freight rates	Independent	Company
Egg New York	$2.34	$8.75 to $9.25	$8.45 to $8.85
Egg Philadelphia	2.39	8.80 to 9.60	8.80 to 8.85
Egg Chicago (net tons)	5.06	7.86 to 8.00	7.83 to 7.90

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$3.25 to 3.50
Wise County, furnace	3.75 to 4.50
Alabama, furnace	5.00 to 5.50
Foundry, Newark, N. J., del.	10.41
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.50
Foundry, St. Louis	12.50
Foundry, Granite City, Ill.	12.50
Foundry, Alabama	6.00 to 6.50

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	$1.95
Corning, Ohio	2.15
Lima	2.28
Pennsylvania	3.75 to 4.25
Wooster, Ohio	2.15
Indiana—Illinois.	
Illinois	2.07
Indiana	2.08
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity)	.90 to 1.05

* No quotation, due to strike.

Gulf Coast.

Gulf Coast, Grade A	$2.00
Gulf Coast, Grade B	1.70

GAS OILS.

Gas Oil, Bayonne, bulk gal.	5½ to 6½c
Gas Oil (32-36) Illinois-Indiana,	4.93 to 5.18
Gas Oil (32-36) Oklahoma, gal.	2¾ to 3 c
Gas Oil (32-36) Gulf Coast, gal	5 to 5½c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$64.20 to $65.20
Six-inch and over, Chicago	60.20 to 61.20
Four-inch, Birmingham	57.00 to 58.00
Six-inch and over, Birmingham	53.00 to 54.00
Four-inch, New York	70.60 to 71.60
Six-inch and over, New York	65.60 to 66.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; Reporter)
4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb.	5 to 5¼c
Ammonia aqua, 20 deg. drums lb.	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb.	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb.	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs.	$2.60 to $2.65
Potash prussiate, yellow casks, lb.	18½ to 19 c
Potash prussiate, red casks, lb.	35 to 37 c
Soda prussiate, yellow casks,	10½ to 11 c
Soda sulphocyanide, barrels, lb.	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

Benzol C. P. tanks, works, gal.	24 to 25c
Benzol, drums, gal.	30c
Benzol, 90% tanks, works, gal.	23c
Benzol, 90% drums, gal.	28c
Napthalene, flake, barrels, lb.	5 to 5½c
Napthalene, dyestuff bags, lb.	5 to 5½c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal.	29 to 30c
Toluene, C. P. tanks, works, gal.	31c
Toluene C. P. drums, works, gal.	36c

Coal

While there is yet no noticeable recession from the policy of curtailment that has prevailed for some time in most industrial lines, due in some cases to overproduction in the latter part of last year and the early part of this year, with consequent heavy carry-over, basic conditions are pronounced as sound by industrial leaders, who give assurances that an industrial revival may be expected by autumn. The usual cautious policy of business during a Presidential election year has hit the coal industry particularly hard, but the passage and signing of the tax-reduction bill, as well as the adjournment of Congress, undoubtedly will prove of benefit in hastening the expected upturn.

Petroleum

Crude oil production again gained for the week ended May 31, an increase of 3,200 barrels in the daily average being recorded. Production in California continued to decline, a drop of 10,250 barrels being registered during the week ended May 31. This loss in production for the week was more than made up by Arkansas, North Texas and Oklahoma, with a total increase of 17,750 barrels.

NEWS OF THE GAS INDUSTRY

Coming Convention of Canadian Gas Association

A Letter from the Secretary

It is with pleasure we announce the 17th annual convention of this association, to be held in Toronto, Canada, Thursday and Friday, August 28 and 29, 1924.

The program is going to be an exceptionally interesting and profitable one, as the meeting is to be held during the first week of the Canadian National Exhibition—the largest and finest annual fair in the world. We trust that the double event will prove an extra drawing card and that our friends will take advantage of killing two birds with one stone.

The King Edward Hotel will be convention headquarters, and as this is going to be a busy time of the year we strongly advise reservations being made early. Hoping to have you with us,

(Signed) G. W. ALLEN,
Secretary-Treasurer.

Contracts Awarded

The Portsmouth (Va.) Gas Company recently awarded contract to the U. G. I. Contracting Company, Philadelphia, for the installation of carburetted water gas apparatus and other equipment. They have now awarded to the same company an additional contract covering the installation of a complete hydraulic pumping system for the new apparatus.

Missoula Gas & Coke Co. Buys Garden City Firm

Missoula, Mont.—The Missoula Gas & Coke Co., newly incorporated, has purchased the entire gas property of the Garden City Gas Company, formerly owned by Henry B. Smith of Bay City, Mich., who has been operating the gas utility here for the past year. Articles of incorporation have been filed with the county clerk and recorder.

Officers and directors of the Missoula Gas & Coke Co. are Mr. Cardell, president, formerly general manager of the Garden City Gas Company, and who was at one time president and general manager of the Billings Gas Company; James H. McGill of Valparaiso, Ind., vice-president; George Arnott, Jr., Billings, treasurer; Lloyd L. Swingle, Missoula, secretary.

Mr. Cardell says the company expects to expand its gas mains in Missoula this summer with the aim of maintaining the high standard of gas service which the old company established last year. Approximately $50,000 will be required to build a new trunk line of large size to convey gas from the gas works to the center of the city to meet the demand for industrial gas for heating which has greatly increased since the company's voluntary reduction in gas rates the first of this year.

John B. Klumpp New Vice-President of U. G. I.

John B. Klumpp was elected a vice-president of the United Gas Improvement Company recently by the board of directors. He has been in the employ of the company for 30 years.

Mr. Klumpp, who will assume in the public utility field. He is president of the American Gas Association and a member of the American Society of Mechanical Engineers, American Institute of Electrical Engineers and the Institution of Gas Engineers of Great Britain.

JOHN B. KLUMPP

Donald McDonald Dies at Louisville

Donald McDonald, vice-president and general manager of the Louisville Gas & Electric Co., died Tuesday, June 3, after an illness of only one day. Just after completing an address to the Electric Club of Louisville at noon Monday, urging support of a proposed bond issue for road construction in the State of Kentucky, Mr. McDonald was stricken with apoplexy. He was removed to a hospital, but never regained consciousness, and passed away at 2 o'clock Tuesday afternoon. He is survived by Mrs.

McDonald, a son and three daughters.

Mr. McDonald gave more than thirty years of his life to the service of the public in the field of gas and electric utilities. Always a hard and earnest worker, he was loved and honored alike by employees and business associates. He was never so happy as when engaged in some task which required the exercise of his wide technical knowledge and experience. His duties as a citizen were filled by whole-hearted co-operation in all movements for the good of city, state and nation.

Mr. McDonald was born in Winchester, Virginia, September 5, 1858. His first connection with the business was in 1891, when he undertook some special engineering work for the Kentucky Rock Gas Company, which furnished natural gas to Louisville from fields in Meade and Hardin counties, Kentucky. Upon reorganization of that company in 1892, as the Kentucky Heating Company, he became president. In 1906 he helped to organize the Kentucky Electric Company, and was president during the first two years of its existence.

In 1913, when a consolidation of all the competing electric and gas companies in Louisville was effected by H. M. Byllesby & Co., he was elected vice-president and general manager of the Louisville Gas & Electric Co., which position he occupied until the time of his death.

Gas Rates for Peekskill

Albany, N. Y.—Gas service is supplied in the village of Peekskill, N. Y., by the Peekskill Lighting & Railroad Co. Schedule filed to become effective May 31, 1924, under authority of order of the Commission dated May 22, 1924, provides rates as follows for gas for light, heat or power: First 100 cu. ft., 75 cents; next 100,000 cu. ft., $1.65 per 1,000 cu. ft.; next 200,000 cu. ft., $1.60 per 1,000 cu. ft.; next 300,000 cu. ft., $1.55 per 1,000 cu. ft.; next 400,000 cu. ft., $1.50 per 1,000 cu. ft.; all over 1,000,100 cu. ft. per month, $1.45 per 1,000 cu. ft. Effects increase of 15 cents per 1,000 cu. ft. for all consumption in excess of 100 cu. ft. per month.

New Installations

Lynn (Mass.) Gas & Electric Company is preparing to install the U. G. I. heavy oil nebulizing system on its carburetted water gas apparatus and has placed the order with the U. G. I. Contracting Company, Philadelphia, for this system.

The Savannah (Ga.) Gas Company has awarded contract to the U. G. I. Contracting Company, Philadelphia, for the installation of a U. G. I. vertical waste heat boiler. Upon completion of this installation, the waste heat boiler will take over a large part of the steam load formerly carried by the regular boiler plant at the Savannah gas works.

Clifford E. Paige New Vice-President Brooklyn Union Gas Co.

Brooklyn, N. Y.—Clifford E. Paige, now vice-president of C. H. Tenney & Co., is to become vice-president of the Brooklyn Union Gas Co.

Mr. Paige is well known in the gas industry and is one of the outstanding figures in the gas field in New England. He was president of the New England Association of Gas Engineers in 1922-23. Mr. Paige has been associated with the Tenney companies since he first entered the gas business.

Laclede Gas Will Expand Its Plant

New York, N. Y.—The Laclede Gas Company, recently acquired by Charles A. Munroe, formerly vice-president of the Peoples Gas Light & Coke Co. of Chicago, is working out plans to carry out a substantial expansion program. Details of the method of financing this program, however, are yet to be worked out.

Mr. Munroe, who has been elected chairman of the board of the company, has acquired with associates a large amount of the capital stock of the company, now paying 7 per cent dividends, and an offering of some of this stock to employees and consumers may eventually be made, as the policy of customer ownership is favored. The earning power of the company has greatly improved.

Reconstruction Work on St. Joseph (Mo.) Gas Plant

The St. Joseph Gas Company of St. Joseph, Mo., has placed an order with the Gas Machinery Company of Cleveland, Ohio, for the reconstruction of the two 11-foot gas machinery sets which were installed in St. Joseph in 1912. The work includes hydraulic control equipment for hand hydraulic operation, larger clinkering doors, gauge boards and other auxiliary parts.

The St. Joseph Gas Company is rearranging its equipment for more efficient operation and is preparing to take care of its increasing send out, and continue to render the efficient service it has always given in the past.

Canadian Gas Co. Issues Interesting Pamphlet Explaining Service Charge

The Consumers Gas Company of Toronto, Canada, has issued an interesting pamphlet entitled "What Is the Service Charge?" printed in black and yellow, explaining to its consumers the service charge. The company found this booklet, which is reprinted herewith, very helpful in clearing up questions not understood clearly by its consumers:

Why Is There a Service Charge in the Gas Business—and How Did It Come About?

Why is there a service charge in the gas business and how did it come about? Here is the simple explanation.

To every customer using gas we send a bill each month. That bill is made up of a charge per 1,000 cubic feet for the gas used and a 50 cent "Service Charge."

The service charge is present regardless of how much or how little gas is used—every customer pays it.

No—it isn't a "meter charge," nor a "meter rental." The gas company doesn't charge for the use of a meter any more than a store charges for the use of its delivery truck when it sends a parcel to your home.

Then why a service charge at all? Doesn't the gas company make a profit on the gas it sells? Doesn't this service charge make the poor man's gas cost more? Doesn't it pile up into an enormous volume of "easy profits" for the company?

These questions may have been in your mind. They should be answered.

First—a Little History

The Consumers Gas Company was founded in 1847, at a time when public service companies at large were not thought of. The gas company's capital was therefore subscribed by certain private individuals. But the government, foreseeing the big market the gas company would have, provided that the shareholders should under no circumstances receive more than 10 per cent dividends. Actually and in practice the return is much nearer 6 per cent than 10 per cent on the average shareholder's investment.

Later it was also provided that the company's surplus profits should go into a special account, and whenever these profits reached an amount equal to 5 cents per thousand cubic feet reckoned on the gas sold in the previous year, the price of gas would be dropped 5 cents per thousand. Reductions have been made from time to time, and always in advance of due dates.

To insure that the gas company shall play fair with the citizens it is required by law that the Mayor of the city shall always sit on the board of directors and further that its annual statement shall be verified by auditors appointed by the City Council.

Practically a Public Service Body

So you see the Consumers Gas Company is practically a public service body. It is impossible for us to store up large profits—they must by law go back to the people in the shape of reduced gas rates.

The gas company does of course make a profit on the gas it sells, but until the "service charge" form of rate was inaugurated it had thousands of customers on its books whom it actually served at a loss. Now no reasonable person expects a gas company, a store, or any other enterprise to serve him at a loss.

Why was there a loss? Simply because often in the homes of well-to-do people and in many offices, stores, professional and business places, gas was used only off and on, or in very small quantities—now and then for heating a room—for emergency lighting—for occasional use in professional work or manufacturing processes.

Of course, regardless of the amount of gas used, or if none were used at all, which often happened for months at a time, we had to read the meter every month, make the necessary records and accounts, provide for operating expenses, management, etc. Also all meters had to be inspected (as required by the government) at our expense, and we had to have men ready day and night to correct anything that went wrong among our services. The customer who used gas in such small quantities that the actual charge for it did not cover his share of the cost of these operations, was causing us a loss.

Customers That Cost Money

The money lost on such customers had to be made up by those who used a reasonable amount of gas. There was no other way. It simply meant that these unprofitable and favored customers would keep up the price of gas for the rest of us indefinitely.

In order to eliminate this unjust discrimination against the average Toronto householder we decided on the flat rate of 50 cents per month per customer, which just about pays for the service which can fairly be charged against each user. Being secure against actual loss, we have been able to supply gas at a very much lower rate than would otherwise have been possible. All we want is simply not to have to compel one class of customers to pay for the services furnished for the benefit of another class of consumers. Every Toronto citizen will endorse that position.

The Fairest Possible Arrangement

The service charge is the fairest possible arrangement in the interests of the average consumer. It is not new with us, of course. It has formed part of the rate schedules of electric companies for many years. As an example, the Toronto Hydro Electric System has always included in its rate schedules a service charge for domestic service. In fact, every class of electric user is asked to pay the fixed costs of service each month, in addition to the charge based upon the quantity of electric current used.

What we do for one we must do for all. This is the working motto of the Consumers Gas Company. And that is the explanation of the service charge—we sincerely hope it will be satisfactory to you.

Yours faithfully,

THE CONSUMERS GAS CO.,

of Toronto.